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August 17, 2001

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1200 Ontario St., 9th Floor
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Re: Ohio v. Anthony Green
Court No. CR 228250
Our File No. 00-731
On Habeas Corpus

Report

Background

The following information was communicated to us by Jason Miller, law student at The Innocence Project: The Green case involves a sexual assault in which the victim is Jennifer Tennant; and the convicted defendant is Anthony Green. Green was convicted of the Tennant rape and aggravated robbery in a Cuyahoga County, Ohio, jury trial on October 21, 1988, and sentenced to 50 years in prison.

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On or about May 29, 1988, Jennifer Tennant was attacked in her room at the Cleveland Clinic Hotel. Ms. Tennant was a resident at this hotel while she was receiving medical treatment for cancer. Late on the evening of May 29 an assailant knocked on Tennant's room door; and when she opened it, the assailant grabbed her by the throat, threatened her with a knife, and forced her onto her bed. Initially the assailant demanded money from her purse. Next the assailant demanded that she remove her clothing whereupon she was raped. After raping Tennant, the assailant wiped his penis on a hotel room washcloth and fled the scene.

After her assailant left her hotel room, Ms Tennant called hotel security and the police were notified. Tennant gave a general physical description of her assailant to the police. Anthony Green was a former employee of the Cleveland Clinic whose physical description was similar to the assailant description provided by Tennant. Green was arrested for the Tennant rape and later identified by Tennant as her rapist and assailant.

The washcloth used by Tennant's assailant to wipe his penis after the sexual assault was examined by Joseph Serowick of the Cleveland Police Department Crime Laboratory. Serowick examined both a semen stain and a hair recovered from this washcloth.

Serowick determined that semen was present on the washcloth employed by the assailant to wipe himself after he assaulted Jennifer Tennant. Serowick determined that both Anthony Green and Jennifer Tennant were ABO type B secretors. During his trial testimony Serowick testified that the semen originated from an ABO type B secretor. Serowick also testified that only 16% of the Black population could be a source of the semen and that 84% of the population would be excluded as a potential source of the semen. Serowick's testimony was then used by the prosecutor as corroboration of Tennant's eye witness identification of Anthony Green in closing arguments. This testimony is discussed in detail at the end of this report.

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Serowick also found a single hair on the washcloth. Despite the fact that Tennant's assailant used the washcloth to wipe his genitals after the sexual assault, Serowick claimed in his trial testimony that the hair from the washcloth "matched" the head hair from Anthony Green "in respect to color" as well as other claimed individualizing characteristics and that this hair originated from an individual of African ancestry. Serowick determined that this hair was "inconsistent" with Green's pubic hair. Serowick went on to testify that his hair analysis failed to eliminate Anthony Green as the hair source and that his "analysis eliminated a large percentage of the population" as the source of the hair.

Anthony Green claimed at his trial as he does today that he is factually innocent of the Jennifer Tennant rape and robbery. It was requested that PCR based DNA typing be conducted to determine whether or not Anthony Green can be eliminated as the source of the spermatozoa from the Jennifer Tennant washcloth.

Items of Physical Evidence

The following items of physical evidence were received from Jackie Kalonick, phlebotomist with Tri-State Phlebotomy located in Cincinnati, Ohio, on March 15, 2001 via U.S. Certified Mail:

Item

1. Tape-sealed Genescreen envelope containing a plastic swab holder labeled "Anthony M. Green" containing two swabs. The letter of transmittal indicates that this is an oral reference sample from Anthony Green.

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The following items of physical evidence were received from John Chmielewski, Director of the Criminal Division for the Cuyahoga County Clerk of Courts located in Cleveland, Ohio, on July 9, 2001 via U.S. Express Mail:

Unsealed envelope marked "Exhibits, State of Ohio vs. Anthony Green, #228250" containing the following six items:

2. Paper laundry bag marked "Clinic Center Hotel" containing one white washcloth.
3. Two 8 1/2" x 11" color photographs of a motel room, one photograph marked "State's Exhibit 2" and the other marked "State's Exhibit 3".
4. One pay statement for Anthony Green from the Bolton Square Hotel Company, with pay date 01/14/88, labeled "Defendant's Exhibit B".
5. One 1985 W-2 Wage and Tax Statement for Michael Green from the Board of Education, labeled "Defendant's Exhibit C".
6. Five slips of paper, each signed "William D. Jordan, Sr., Foreman".
7. Unsealed envelope marked "State's #1" containing six police mug shots, marked "5-A" through "5-F" respectively, and seven Police Inquiry Cards. The Police Inquiry Cards are pink index cards, each with a small suspect photo glued to one side of the card. The cards are marked "State's Exhibit 6-A" through "State's Exhibit 6-G" respectively.

Examination of the Jennifer Tennant Washcloth [Item 2]

A washcloth collected from Jennifer Tennant at the Clinic Center Hotel [Item 2] was submitted for examination. The packaging for this white washcloth is illustrated in figure 1. The washcloth obverse surface is illustrated in figure 2; the washcloth reverse surface is illustrated in figure 3.

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A large stained area on the washcloth obverse surface has been marked and sampled in three areas during the original evidence examination at the Cleveland Police Department Forensic Laboratory. These previously cutout areas are illustrated in figures 2 and 3. Five discolored areas [A, B, C, D, and E] within the marked stain were selected for further examination. These selected areas are illustrated in figures 4 and 5. Fabric approximately 0.5 cm² was removed from each of these stained areas [A, B, C, D, and E] and extracted. Microscopic examination of the cellular debris revealed a moderate number of spermatozoa and epithelial cells in each of the stained areas. DNA was extracted from these specimens as described below.

Genetic Analysis of DNA

Several genes were amplified using the polymerase chain reaction [PCR] and subsequently typed. These genes include the STR genes known as Profiler Plus [D3S1358, vWA, FGA, D8S1179, D21S11, D18S51, D5S818, D13S317, D7S820]; and amelogenin, a gene that allows sex determination.

D3S1358, vWA, FGA, D8S1179, D21S11, D18S51, D5S818, D13S317, and D7S820 are short tandem repeat [STR] genes. These genes are composed of tandemly repeated units of a core DNA segment where the difference between different alleles is determined by the number of core repeated units contained within the allele. The typical size of the core unit for an STR gene is on the order of four base pairs [bp]. The primers that recognize particular STR genes can be labeled with a fluorescent dye so that the alleles can be detected and quantitatively assessed after electrophoresis.

These STR genes can be grouped so that several gene systems can be typed simultaneously from one analysis. For example, nine STR genes [D3S1358, vWA, FGA, D8S1179, D21S11, D18S51, D5S818, D13S317, D7S820] and amelogenin] are grouped together in a typing system called Profiler Plus. For those genes which employ a D_S_ nomenclature, the number following the "D" designation indicates the human chromosomal location of the gene locus. Some of these genes employ a different nomenclature determined by their discoverers. For example, the following STR genes are in this category:

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The vWA gene is located on chromosome 12. The FGA gene is located on chromosome 4.

The amelogenin gene is located on the sex determining X and Y chromosomes. Amelogenin is a gene responsible for the synthesis of a protein associated with fetal tooth bud development. A portion of this gene on the X chromosome contains a 6 bp deleted DNA segment allowing this region of the X chromosome to be distinguished from the corresponding region of the Y chromosome by size. Since females possess two X chromosomes and males possess an X and a Y chromosome, the sex of a specimen source can be determined by examining this DNA region using electrophoresis.

Genetic analysis of the specimens in this case involved the following essential steps:

1. Epithelial cells were digested with SDS and proteinase K followed by digestion of spermatozoa with SDS, proteinase K, and DTT [dithiothreitol]. Blood was digested with SDS and proteinase K.
2. DNA was extracted from sample digests with chloroform/phenol and concentrated using Centricon molecular filters.
3. The various genes described above were amplified using the Polymerase Chain Reaction [PCR].
4. The STR genes and amelogenin were typed using capillary electrophoresis.

The results of this analysis are summarized in Table 1. These findings revealed the following observed facts:

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Reference Samples

1. Anthony Green was determined to be D3S1358 type 15,17; vWA type 16,17; FGA type 24,25; D8S1179 type 11,12; D21S11 type 28,30; D18S51 type 17,18; D5S818 type 8,12; D13S317 type 14,14; and D7S820 type 10,10. This DNA was also determined to originate from a male by analysis of the amelogenin gene.

Spermatozoa from the Jennifer Tennant Washcloth Item 2

2. The DNA from spermatozoa recovered from the Jennifer Tennant washcloth [Item 2] in areas A, B, C, D, and E was determined to be D3S1358 type 16,17; vWA type 15,19; FGA type 19,25; D8S1179 type 14,14; D21S11 type 31,31.2; D18S51 type 14,2,19; D5S818 type 11,12; D13S317 type 9,13; and D7S820 type 8,10. This DNA was also determined to originate from a male by analysis of the amelogenin gene. This array of genotypes occurs in significantly less than one out of 100,000 members of the population. The calculated genotype frequencies indicate that it is unlikely that more than one human being has ever possessed this particular genotype array. The frequencies associated with individual genotypes are summarized in Appendix 1 below.
3. Anthony Green is eliminated as the source of the spermatozoa from the Jennifer Tennant washcloth [Item 2] in areas A, B, C, D, and E.
4. The genetic profile from Jennifer Tennant can be inferred from the female epithelial cell DNA commingled with spermatozoa on the Tennant washcloth [Item 2]. Based on an analysis of these female epithelial cells, Jennifer Tennant was determined to be D3S1358 type 16,16; vWA type 15,18; FGA type 20,25; D8S1179 type 11,14; D21S11 type 28,29; D18S51 type 13,16; D5S818 type 11,13; D13S317 type 8,12; and D7S820 type 9,11. This DNA was also determined to originate from a female by analysis of the amelogenin gene.

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5. All of the DNA recovered in the non sperm fractions from washcloth areas A, B, C, D, and E contain DNA from Jennifer Tennant or from Jennifer Tennant commingled with the sperm source described above.
6. A highly discriminating genetic profile of the spermatozoa source on the Jennifer Tennant washcloth has been obtained. These spermatozoa originate from a single male with a genetic profile that is expected to be unique in the human population. This genetic profile can be employed to search local and national violent offender libraries to correctly identify Jennifer Tennant's assailant.

The Forensic Serology Evidence of Joseph Serowick

7. The eye witness identification of Anthony Green was corroborated at trial by the testimony of Joseph Serowick, an employee of the Cleveland Police Department Laboratory. Jennifer Tennant had stated to police that she had been assaulted by a Black male who forced her to have vaginal intercourse on her hotel room bed. According to Tennant the assailant ejaculated during this rape and then went into Tennant's bathroom and wiped off his genitals with a washcloth and then fled the scene¹. This scenario painted a clear expectation for the presence semen commingled with Jennifer Tennant's vaginal secretions on this washcloth.
8. Serowick found a large stain on the washcloth collected from the Clinic Center Hotel, Exhibit 1. He circled this stain and then examined it. Initially he conducted an acid phosphatase screening test to look for semen; this test was followed by a p30 crossover electrophoresis "confirmatory" test for semen. Serowick did not describe a microscopic examination of the cellular material in the washcloth stain; nor did he report a quantitative acid phosphatase or p30 assay to estimate the

¹ Investigation Report Dated May 30, 1988, by Officer Burner.

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semen concentration in his preparations from the washcloth stain². His trial testimony left the impression that the semen stain on the washcloth was a neat semen stain rather than a semen stain commingled with the vaginal secretions of Jennifer Tennant even though he knew or should have known the opposite to be the case.

9. Following the identification of semen on the washcloth, Serowick conducted an ABO typing analysis. ABO B and H blood group substances were detected in the washcloth stain. Prior to conducting the ABO typing analysis on the washcloth stain, Serowick had conducted an ABO typing analysis on saliva from Jennifer Tennant and Anthony Green. This analysis revealed that both Jennifer Tennant and Anthony Green were ABO type B secretors. This work was tersely described in laboratory reports dated June 6, 1988 [Green] and June 8, 1988 [Tennant].
10. Despite knowing that Jennifer Tennant was an ABO type B secretor and despite knowing that the deposits on the washcloth were commingled with Jennifer Tennant's vaginal secretions by her own account to police, Serowick claimed in his sworn trial testimony that his ABO findings revealed that the semen originated from a secretor with ABO type B blood³.

² TT 216-218.

³ Q: Was the person that deposited that seminal fluid on that wash rag a secretor?

A: Yes, he was.

Q: Okay. And to be sure now so the jury understands your probabilities, four out of five people are secretors; is that correct?

A: That's correct.

Q: And this individual was a secretor?

A: Yes, he was. [TT 219]

Q: And which ABO substances were in this seminal fluid on State's Exhibit 1?

A: I found B antigens and also H antigens, which is consistent with a B blood, which is conducive to a B type.

Q: So from your testing are you able to determine with scientific certainty what type of blood the secretor was who deposited the seminal fluid on State's Exhibit 1, the washcloth?

A: Yes, I was.

Q: What was his blood type?

A: The ABO type of the donor of the seminal fluid was type B. [TT 220]

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11. Serowick went on to testify that ABO type B secretors occur in approximately 16% of the population and that 84% of the population would be unable to deposit the seminal fluid on the washcloth as a consequence of his ABO typing analysis⁴.
 12. Serowick also testified that he knew that Jennifer Tennant was an ABO type B secretor. Yet, he further asserted that the ABO type of the semen on the washcloth was from an ABO type B secretor because he knew he was testing only semen rather than semen commingled with the vaginal secretions from Jennifer Tennant. Serowick had no scientific basis for this assertion, nor did he present any such evidence at trial⁵.
 13. Serowick either knew or should have known that the deposit on the washcloth [State's Exhibit 1] was a commingled specimen containing semen from Jennifer Tennant's assailant and vaginal secretions from Jennifer Tennant herself. He knew this because Jennifer Tennant stated to the detectives that interviewed her that her assailant wiped his genitals with this wash cloth after vaginal intercourse with her.
-
- ⁴ Q: And you have already described that 80 percent are secretors. Based on those two, what portion of the general population does a B secretor eliminate as far as blood type?
A: A B secretor constitutes approximately 16 percent of the population.
Q: So if we understand you correctly, sir, that 84 percent of the population, male population would be unable to deposit that seminal fluid on State's Exhibit 1?
A: That is correct. [TT 220-221]
- ⁵ Q: Now, did you have an occasion to learn, through me, through medical records or whatever -- or did we submit, I don't recall -- the blood type of Jennifer Tennant?
A: Jennifer Tennant submitted a saliva sample, which was taken by myself. And I tested the saliva, her saliva, for the presence of ABO antigens. And I determined that she was a secretor of ABO type B.
Q: So by coincidence the victim is also a B secretor?
A: That is correct.
Q: And the defendant Anthony Green is a B secretor by your testing?
A: Through the blood samples and saliva samples submitted by the defendant, he was determined to be indeed a type B secretor.
Q: All right. You determined, you said you determined earlier from the blood type of the depositor of the seminal fluid on the rag to be a B secretor, was that a male or a female who deposited the seminal fluid which you tested?
A: A female cannot produce or secrete seminal fluid; therefore, a male must have secreted that particular body fluid.
Q: Do you have an opinion, based on the same factors listed before, as to the type of blood, an ABO type, that the secretor who deposited the seminal fluid on State's Exhibit Number 1 was, blood type?
A: The blood type of the man who deposited this particular seminal stain was type B. [TT 221-222]

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Furthermore Serowick could have readily verified the commingled nature of this stain by conducting a normally employed microscopic examination of the cellular debris in this stain which would have revealed spermatozoa commingled with epithelial cells.

14. The prosecutor exploited Serowick's testimony in his closing argument to corroborate the eye witness identification of Anthony Green by Jennifer Tennant in the following way:

This individual [Anthony Green] is picked up, he matches the description exactly. But before he is picked up she [Jennifer Tennant] makes a positive identification from a photo lineup. [TT 458]

Now the calling card. Think of the weight of the evidence, and the scientific evidence. If this were 20 years ago or certainly 50 years ago, you wouldn't have the blood and hair, the serology and hair analysis and toxicology certainly were not sophisticated enough for testimony. This would be all you had in a jury trial 20 years ago. And think about it now. Think about you have blood work. The blood work eliminates 84 percent of the male population of possible suspects. This is probability, it eliminates 86% percent, there is only 14 percent of the male population left that could have done this crime. Out of the 14 percent, you will find that we have the hair analysis. And all the major and minor characteristics were the same. [TT 462]

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15. In fact, the conventional serology analysis conducted by Serowick excluded no one as a potential source of the commingled semen deposit on the washcloth, State's Exhibit 1. This is so because all of the B and H blood group substances detected by Serowick in this stain could have originated from the vaginal secretions of Jennifer Tennant. Thus the semen source could have been a non secretor or a secretor of any ABO blood group type.
16. The only scientific mechanism by which Serowick could eliminate anyone as the contributor to this commingled semen stain based on an ABO typing analysis would be to demonstrate either through quantitative acid phosphatase or p30 assays that the concentration of semen in stain extracts was sufficiently great that the ABO blood group substances from secretors would normally be detected given the sensitivity of his ABO antigen assay. Serowick failed to conduct such tests. In fact, it is not even clear that his ABO test procedure employed cell free stain extracts.
17. Even if Serowick had conducted quantitative assays to estimate the semen concentration in the stain extract and employed an appropriately sensitive assay for ABO blood group substances, the only ABO types that could be eliminated as possible semen sources are individuals who are A secretors and AB secretors. In such a circumstance [which do not exist from the analysis conducted by Serowick in this case], the semen source could be either a non secretor [20%], an O secretor [40%], or a B secretor [18%]. Therefore, 78% of the Black male population would be potential contributors to the semen from the commingled stain on the washcloth State's Exhibit 1. Thus, only 22% of the Black male population could be eliminated as the source of this semen rather than the 84% to 86% claimed by Serowick and the prosecutor.

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18. To state or assert by innuendo that the stain on the washcloth was a neat semen deposit without proof was scientifically irresponsible. To state or assert without proof that ABO blood group substances originate from semen when those same ABO blood group substances are not foreign to the female in a semen deposit commingled with the female's own vaginal secretions misled the jury.
19. Serowick either knew or should have known that his conventional genetic marker analysis failed to reveal demonstrable genetic traits from the semen source because at the time of his trial testimony in 1988 it was well known within the forensic science community that in commingled sexual assault evidence, such as the evidence in this case, the only genetic traits that can be scientifically proven to originate from the semen are those traits which could not be contributed by the victim.⁶ This universally accepted scientific principle is reflected in the State of California's own Information Guide for the California Medical Protocol for Examination of Sexual Assault and Child Sexual Abuse Victims published by the Office of Criminal Justice Planning. Contained within that California state document is a chapter authored by Jan Bashinski, the current bureau chief of the DOJ Bureau of Forensic Services. That chapter entitled "Sexual Assault Evidence and the Criminalistics Laboratory" states, in part, the following:

The fact that semen evidence in sexual assault cases is often mixed with other secretions complicates the interpretation of the genetic typing results. The potential contribution of the victim's own secretions to the genetic typing results must be taken into account, in addition to considering the possible presence of mixtures of semen from multiple assailants or from recent consensual intercourse.

⁶ The only exception to this general rule for the interpretation of sexual assault evidence occurs in the situation where one can prove through testing that the semen concentration in semen stain extracts is sufficiently concentrated that one would be certain to detect the ABO antigens from a secretor. In this circumstance the failure to detect an ABO antigen provides proof that an individual whose ABO type is reflected by the non detected ABO antigen is absent from the semen deposit.

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The significance of the presence on a vaginal swab of genetic types compatible with the types of the suspect depends on establishing that those types are attributable only to the semen in the specimen and not to the victim's own secretions. When reporting that a suspect is included as a possible source of the combination of genetic types found in the semen evidence, the laboratory should indicate as well the frequency with which that combination occurs in the general population to avoid the inference of identity. [p. 149-150, emphasis added]

20. In summary, Serowick failed to notify the prosecutor or the trial jury that the conventional genetic marker traits found in the commingled semen stain evidence could all have been attributable to the victim; and as a consequence they could not be proved to be attributable to the semen source. Serowick improperly implied by innuendo and without scientific proof that the commingled stain on the wash cloth was a neat semen stain from Jennifer Tennant's assailant. Serowick then provided frequency information that stated that only 16 percent of the population could be the source of the semen. The prosecutor then incorrectly employed this evidence to assert that Serowick's semen analysis was corroborative of Tennant's eye witness identification of Anthony Green because Serowick's analysis would have eliminated 84% to 86% of the population of individuals falsely accused of this sexual assault. This entire line of proof misled the jury concerning the scientific significance of Serowick's laboratory examinations.

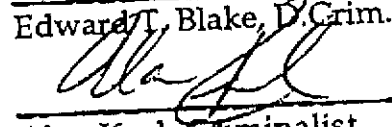
Should you have any questions concerning this work, please contact

us.

Sincerely,



Edward T. Blake, D.Crim.



Alan Keel, Criminalist

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Appendix 1:
Cumulative Frequency Data for the
D3S1358, vWA, FGA, D8S1179, D21S11, D18S51,
D5S818, D13S317, and D7S820 Genotypes

- Item 2A. Spermatozoa from Washcloth, Area A.
 Item 2B. Spermatozoa from Washcloth, Area B.
 Item 2C. Spermatozoa from Washcloth, Area C.
 Item 2D. Spermatozoa from Washcloth, Area D.
 Item 2E. Spermatozoa from Washcloth, Area E.

| Marker | Type | Frequency in Caucasians | Frequency in Blacks | Frequency in Mexican Americans |
|----------------------|---------|-------------------------|---------------------|--------------------------------|
| D3S1358 | 16,17 | 0.1116 | 0.1343 | 0.0653 |
| vWA | 15,19 | 0.0172 | 0.0222 | 0.0124 |
| FGA | 19,25 | <0.01 | 0.0112 | 0.0251 |
| D8S1179 | 14,14 | 0.0231 | 0.1230 | 0.0715 |
| D21S11 | 31,31.2 | 0.0140 | 0.0116 | 0.0129 |
| D18S51 | 14.2,19 | <0.01 | <0.01 | <0.01 |
| D5S818 | 11,12 | 0.2560 | 0.1531 | 0.2552 |
| D13S317 | 9,13 | 0.0133 | <0.01 | 0.0412 |
| D7S820 | 8,10 | 0.0795 | 0.1199 | 0.0612 |
| Cumulative Frequency | | 10-13.8 | 10-13.1 | 10-12.9 |
| Reciprocal Frequency | | 1/59 trillion | 1/11 trillion | 1/8 trillion |

1. Frequency estimates for the Profiler Plus STR genes are based on a study of 200 Caucasians, 201 Blacks, and 202 Mexican Americans conducted by the Serological Research Institute; and a study of 200 Caucasians and 195 Blacks conducted by Applied Biosystems Division.
2. All individual genotype frequencies less than 1% [0.01] were rounded up to 1% [0.01].
3. The population of the Earth is estimated to be approximately 6 billion individuals. The total number of human beings who have ever lived is estimated to be 8 billion individuals.

PCR AMPLIFIED DNA AND TYPING: 00-731

STR Genes TABLE 1

Profiler Plus Genes

| ITEM NO. | DESCRIPTION | Estimated DNA Conc. ng/ul | Sex | Blue | | | Green | | | Yellow | | |
|----------|-------------------------------------|---------------------------|-------------------------------|-------------------|---------------|---------------|--------------|------------------|------------------|-------------------|--------------|--------------|
| | | | | D3S1358 Type | vWA Type | FCA Type | D8S1179 Type | D21S11 Type | D18S51 Type | D5S818 Type | D13S317 Type | D7S820 Type |
| 1 | Anthony Green, Reference Oral Swab. | 50 | XY male | 15,17 | 16,17 | 24,25 | 11,12 | 28,30 | 17,18 | 8,12 | 14,14 | 10,10 |
| 2A | Washcloth, Area A, E Cell Fraction | 0.1 | X>>Y female > male | 16,16 trace 17 | 15,18 > 19 | 20,25 > 19 | 11<14 | 28,29 31,31.2 | 13,16 14.2,19 | 11> 12,13 | 8,12 9,13 | 9,11 8,10 |
| 2A | Washcloth, Area A, Sperm Fraction | 0.5 | XY male | 16,17 | 15,19 | 19,25 | 14,14 | 31,31.2 | 14.2,19 | 11,12 | 9,13 | 8,10 |
| 2B | Washcloth, Area B, E Cell Fraction | 1.5 | X>>>Y female trace male | 16,16 | 15,18 | 20,25 | 11,14 | 28,29 | too weak | 11,13 trace 12 | 8,12 | too weak |
| 2B | Washcloth, Area B, Sperm Fraction | 0.3 | XY male | 16,17 | 15,19 | 19,25 | 14,14 | 31,31.2 | 14.2,19 | 11,12 | 9,13 | 8,10 |
| 2C | Washcloth, Area C, E Cell Fraction | 0.25 | X>>Y female trace male | 16,16 trace 17 | 15,18 | 20,25 | 11,14 | 28,29 | NA | 11,13 trace 12 | 8,12 | too weak |

NA: No Activity
 NIAT: No Activity Due to Inhibition
 H: High
 M: Medium
 L: Low
 1

PCR AMPLIFIED DNA AND TYPING: 00-731

STR Genes TABLE 1

Profiler Plus Genes

| ITEM NO. | DESCRIPTION | Estimated DNA Conc. ng/ul | Sex | Blue | | | Green | | | Yellow | | |
|----------|------------------------------------|---------------------------|------------------|--------------|------------|------------|--------------|-----------------|-------------|-------------|--------------|-------------|
| | | | | D3S1358 Type | vWA Type | FGA Type | D8S1179 Type | D21S11 Type | D18S51 Type | D5S818 Type | D13S317 Type | D7S820 Type |
| 2C | Washcloth, Area C, Sperm Fraction | 0.25 | XY male | 16,17 | 15,19 | 19,25 | 14,14 | 31,31.2 | 14,2,19 | 11,12 | 9,13 | 8,10 |
| 2D | Washcloth, Area D, E Cell Fraction | 0.1 | XY male > female | 16>17 | 15,19 > 18 | 19,25 > 20 | 11<14 | 31,31.2 > 28,29 | NA | 11> 12,13 | 9,13, 8,12 | too weak |
| 2D | Washcloth, Area D, Sperm Fraction | 0.4 | XY male | 16,17 | 15,19 | 19,25 | 14,14 | 31,31.2 | 14,2,19 | 11,12 | 9,13 | 8,10 |
| 2E | Washcloth, Area E, E Cell Fraction | 6.25 | XX female | 16,16 | 15,18 | 20,25 | 11,14 | 28,29 | 13,16 | 11,13 | 8,12 | 9,11 |
| 2E | Washcloth, Area E, Sperm Fraction | 0.25 | XY male | 16,17 | 15,19 | 19,25 | 14,14 | 31,31.2 | 14,2,19 | 11,12 | 9,13 | 8,10 |
| | Extraction Blank | 0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

H: High
M: Medium
L: Low

NA: No Activity
NAT: No Activity Due to Inhibition

PCR AMPLIFIED DNA AND TYPING: 00-731
STR Genes TABLE 1

Profiler Plus Genes

| ITEM NO. | DESCRIPTION | Estimated DNA Conc. ng/ul | Sex | Blue | | | | | | Green | | | Yellow | | |
|----------|------------------|---------------------------|-----------|--------------|----------|----------|--------------|-------------|-------------|-------------|--------------|-------------|--------|--|--|
| | | | | D3S1358 Type | vWA Type | FGA Type | D8S1179 Type | D21S11 Type | D18S51 Type | D5S818 Type | D13S317 Type | D7S820 Type | | | |
| | Kit DNA Standard | 0.1 | XX female | 14,15 | 17,18 | 23,24 | 13,13 | 30,30 | 15,19 | 11,11 | 11,11 | 10,11 | | | |
| | AMS DNA Standard | 0.1 | XX female | 14,15 | 18,20 | 21,25 | 10,14 | 29,29 | 13,18 | 11,12 | 12,14 | 9,10 | | | |
| | PCR Blank | 0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | | | |

H: High
M: Medium
L: Low

PCR Based Analysis of STR Genes
from

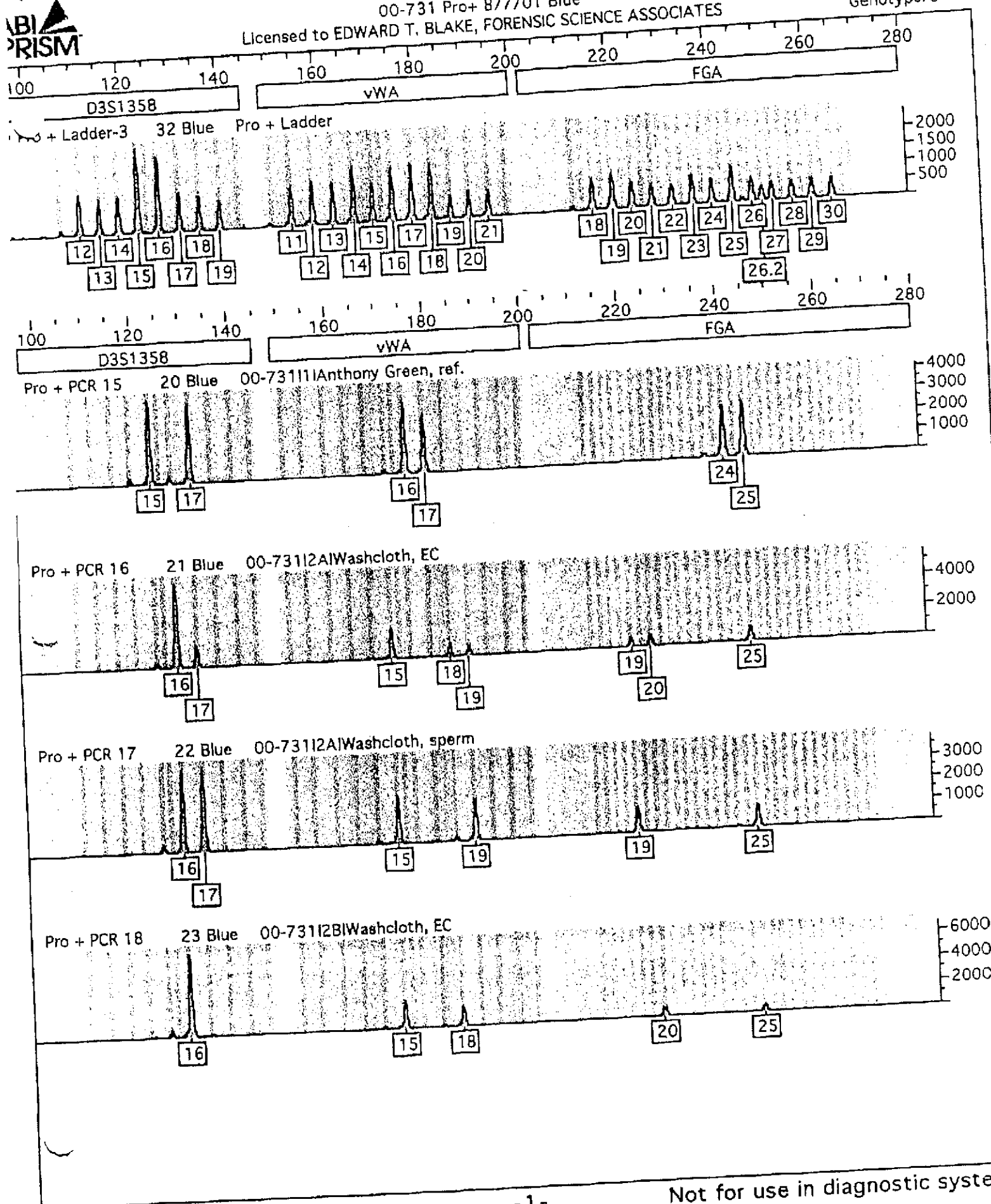
- Item 1. Anthony Green.
- Item 2A. Washcloth, Area A.
- Item 2B. Washcloth, Area B.
- Item 2C. Washcloth, Area C.
- Item 2D. Washcloth, Area D.
- Item 2E. Washcloth, Area E.

08/21/2001 13:31 5102225

CRIME LAB

3:43:52 PM Fri, Aug 17, 2001
Genotyper® 2.0

00-731 Pro+ 8/7/01 Blue
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For research use only

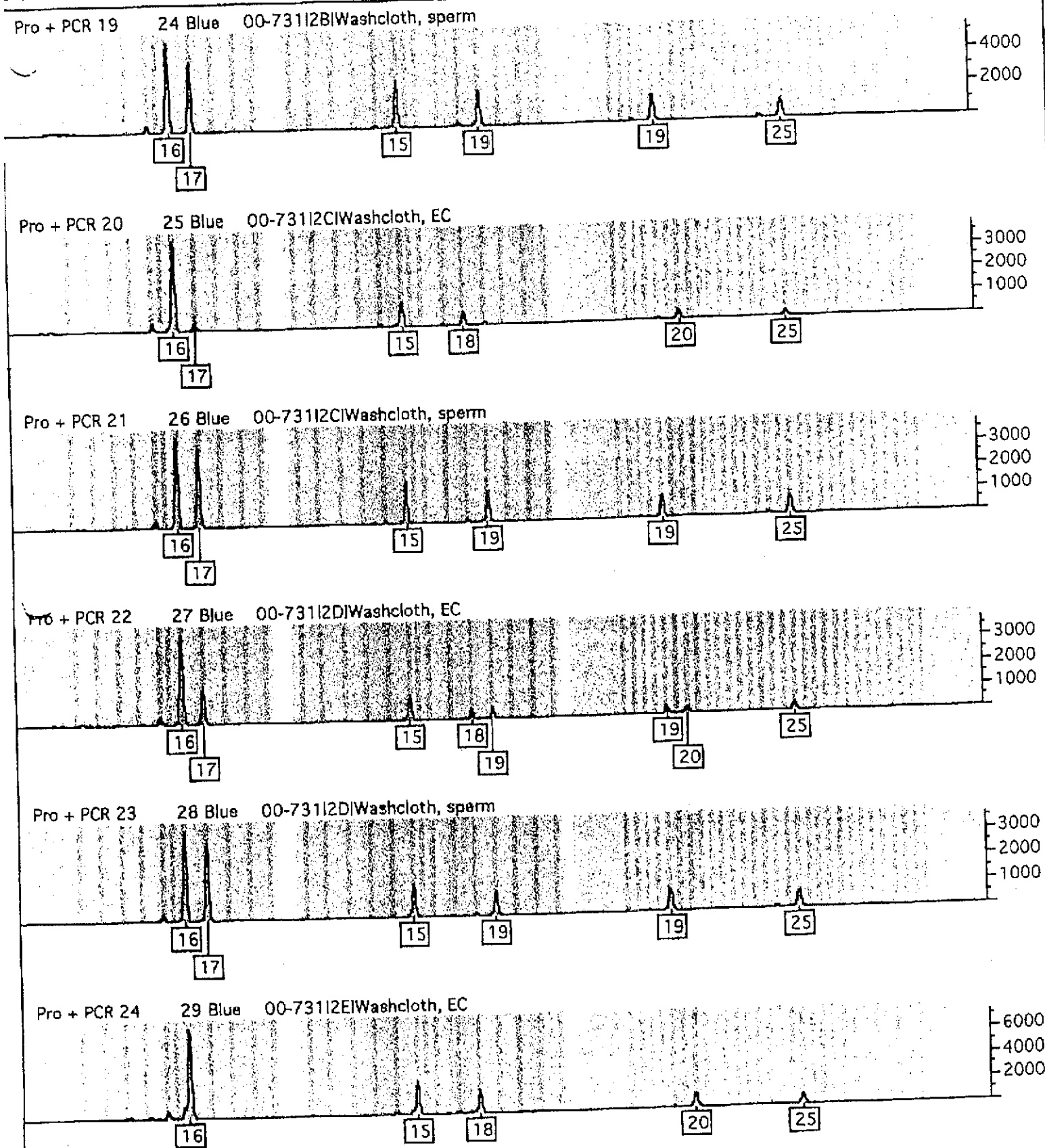
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Not for use in diagnostic system



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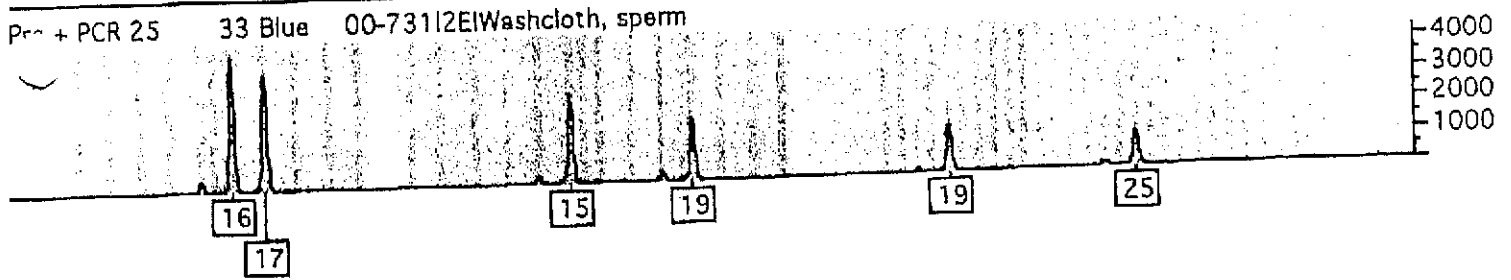
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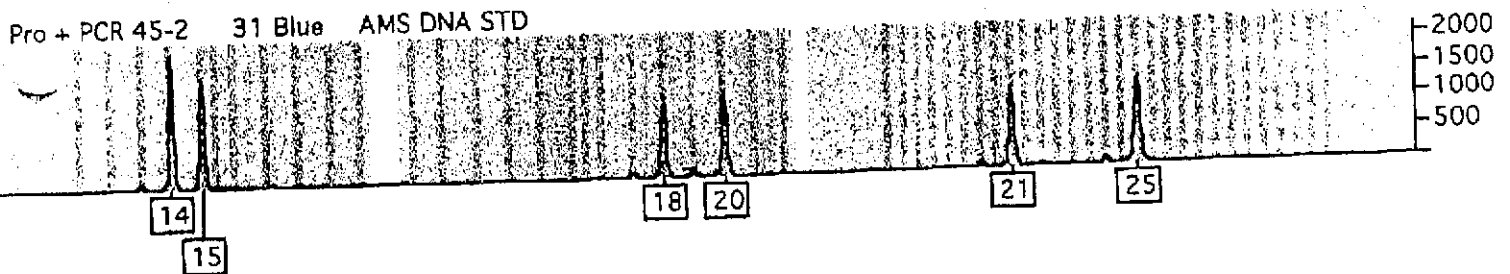
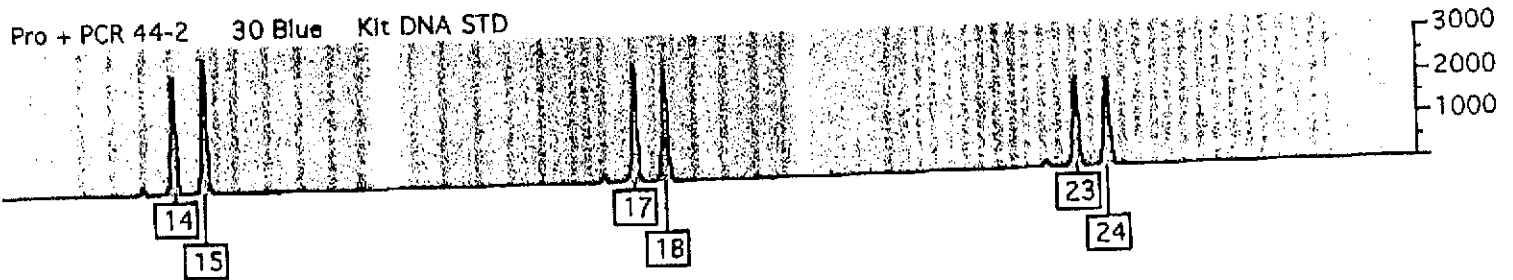
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Pro + PCR 26 34 Blue 00-731|Extraction blank

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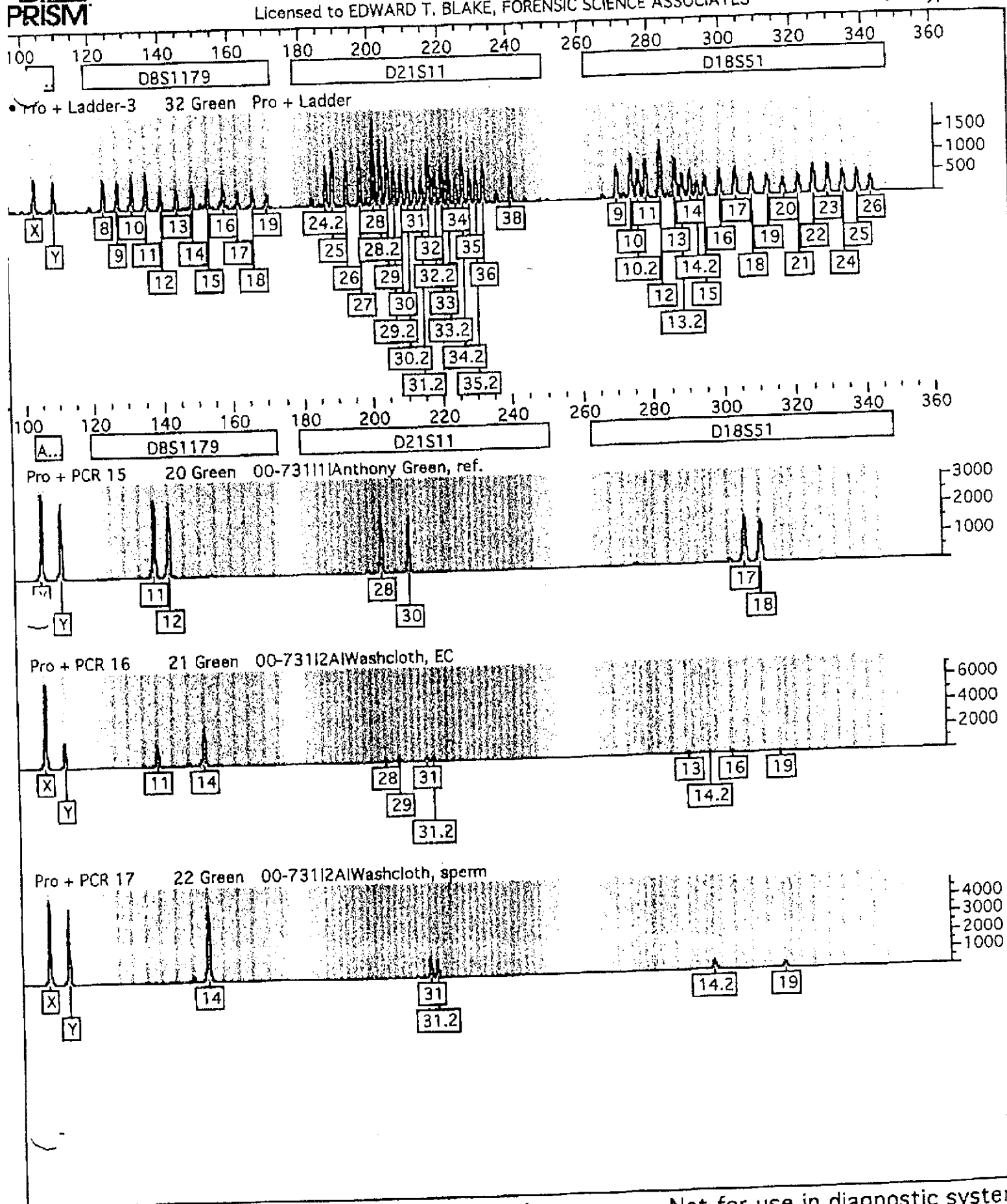
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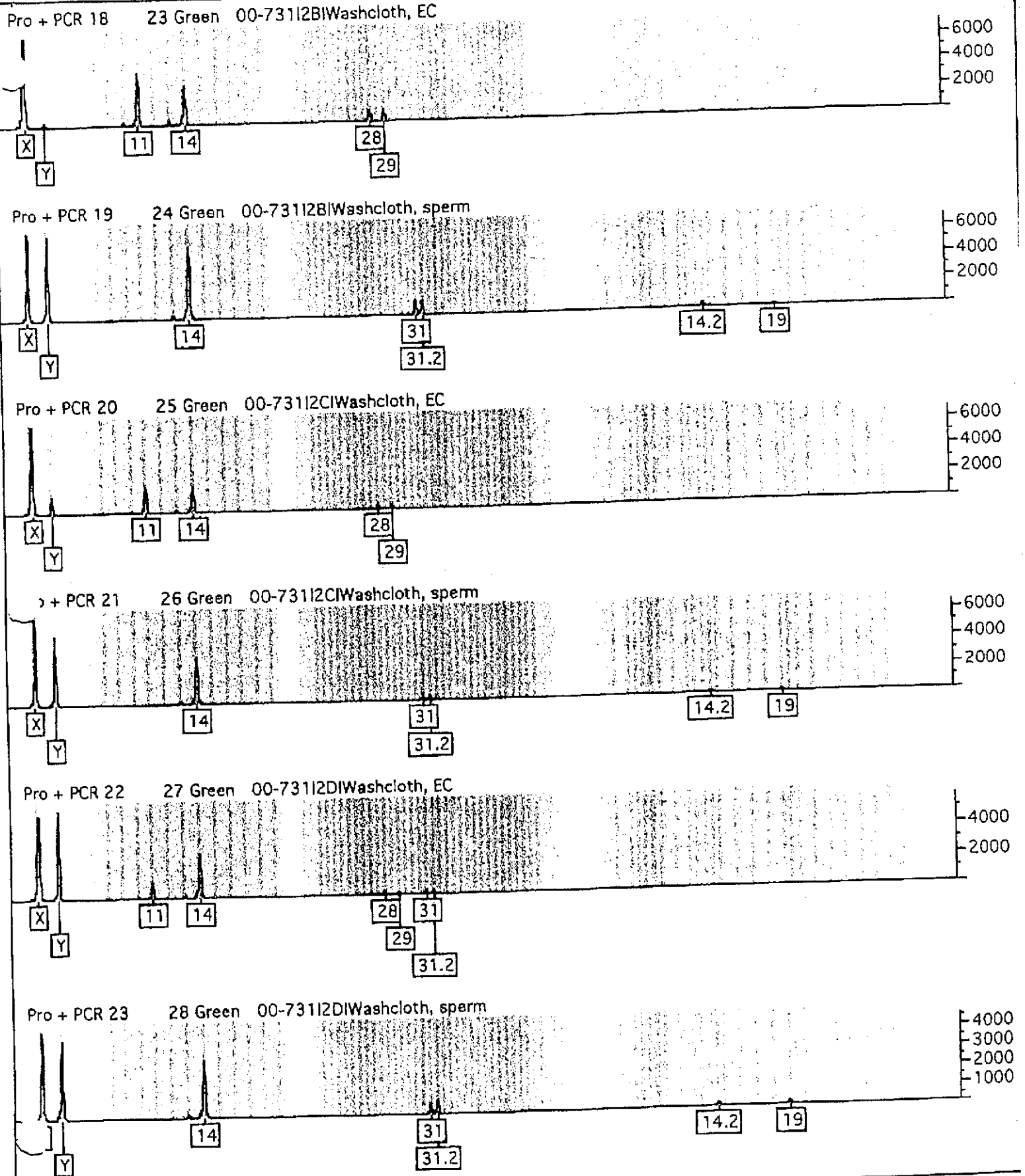
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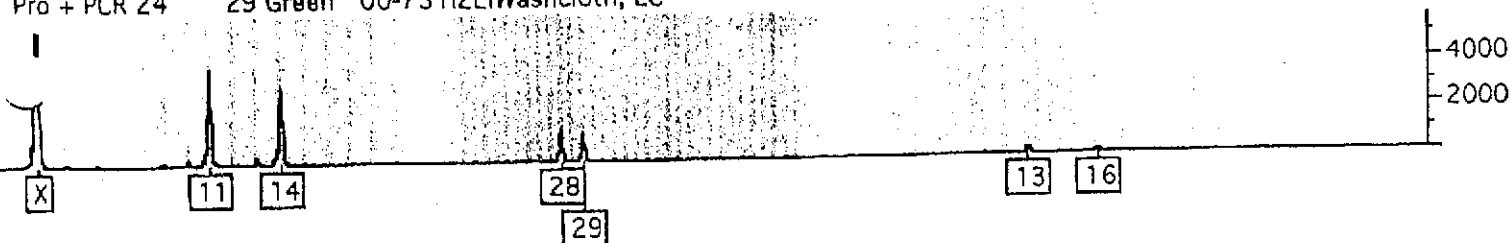




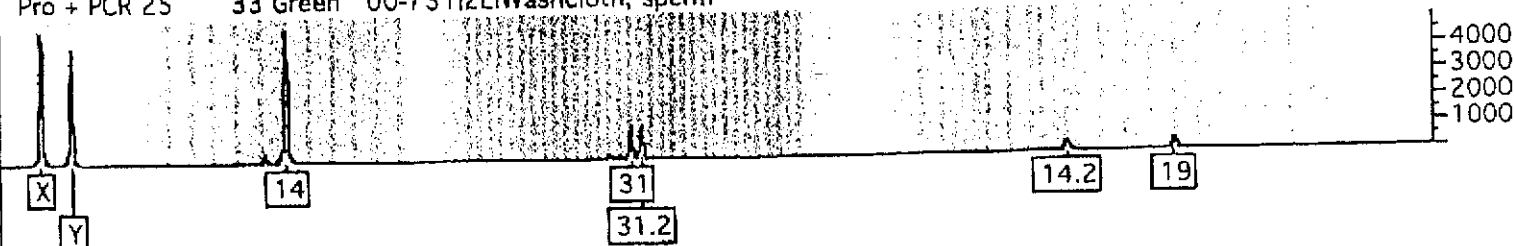
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Pro + PCR 24 29 Green 00-731|2EIWashcloth, EC



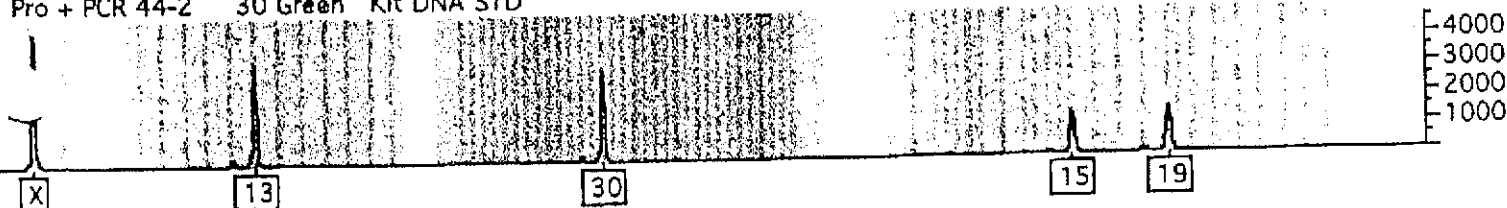
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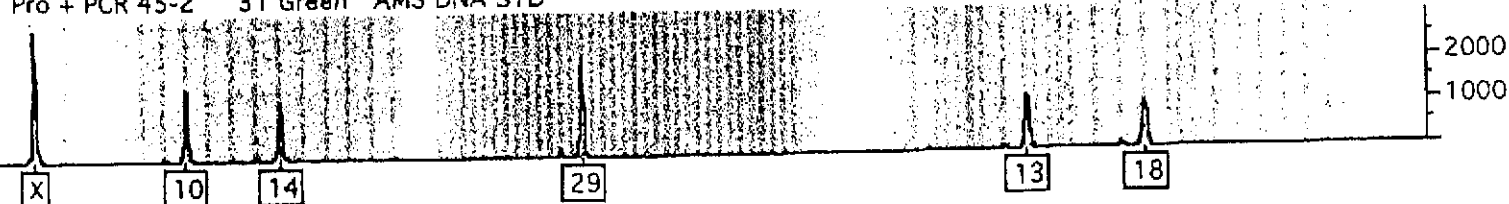
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Pro + PCR 45-2 31 Green AMS DNA STD



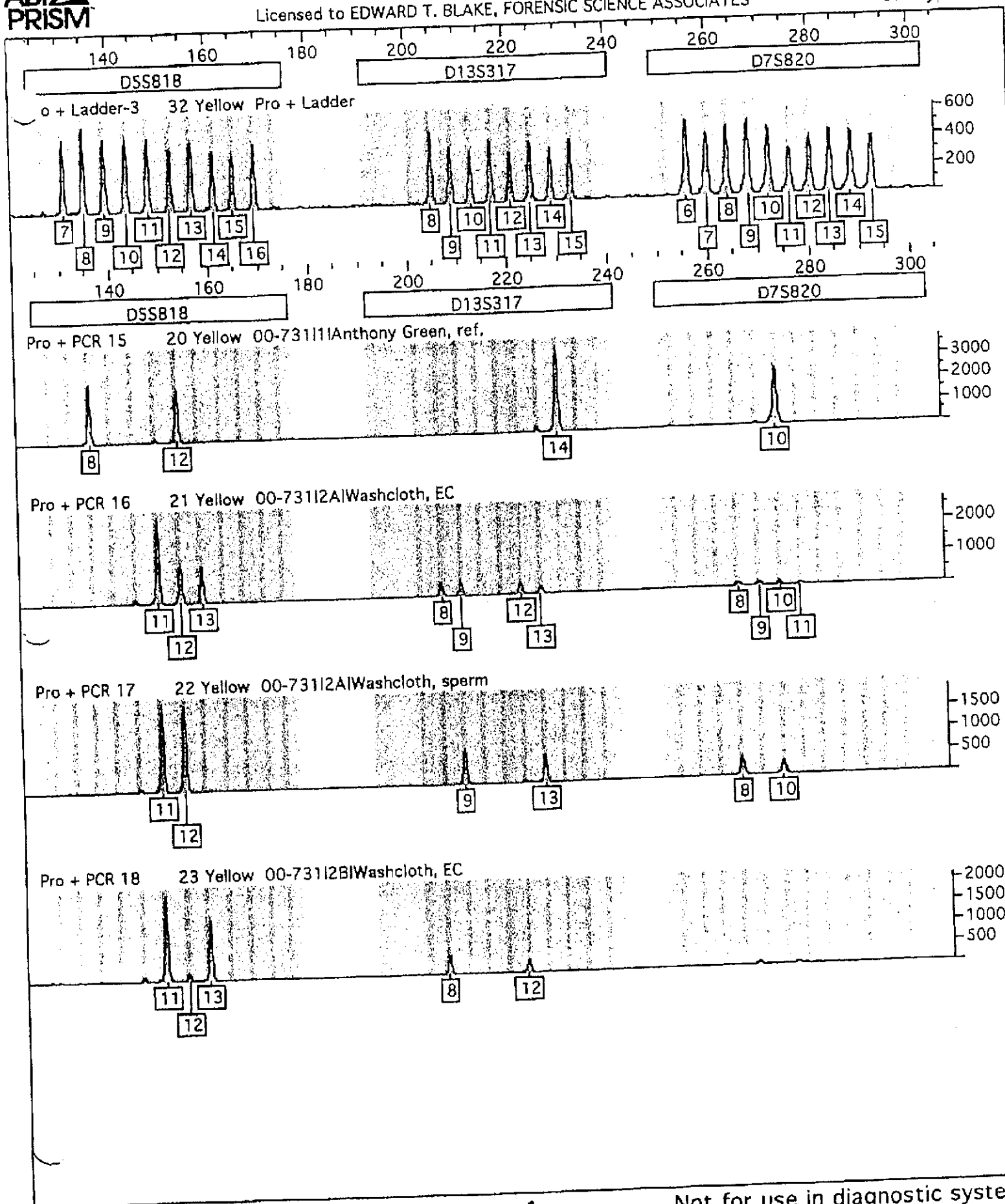
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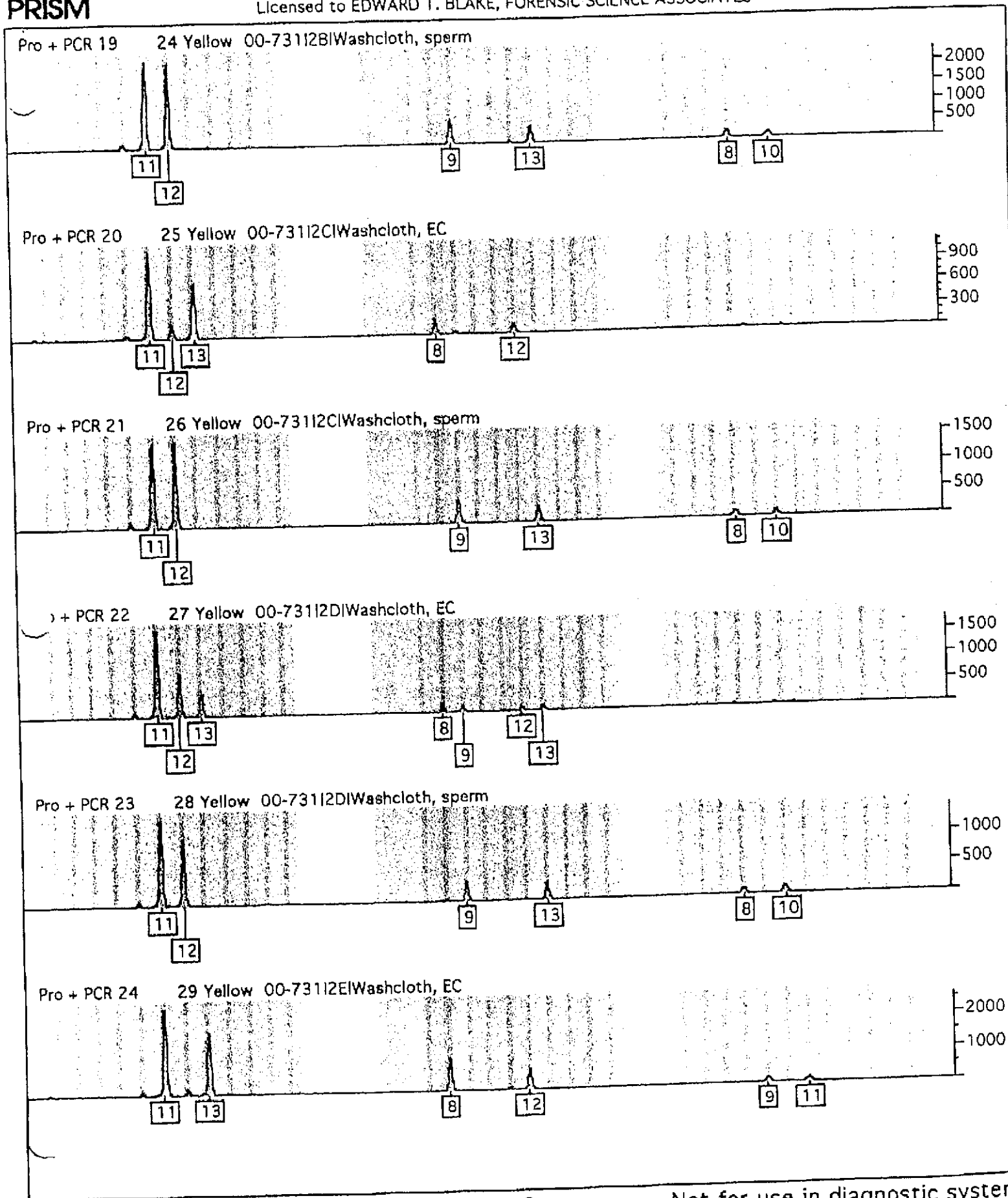
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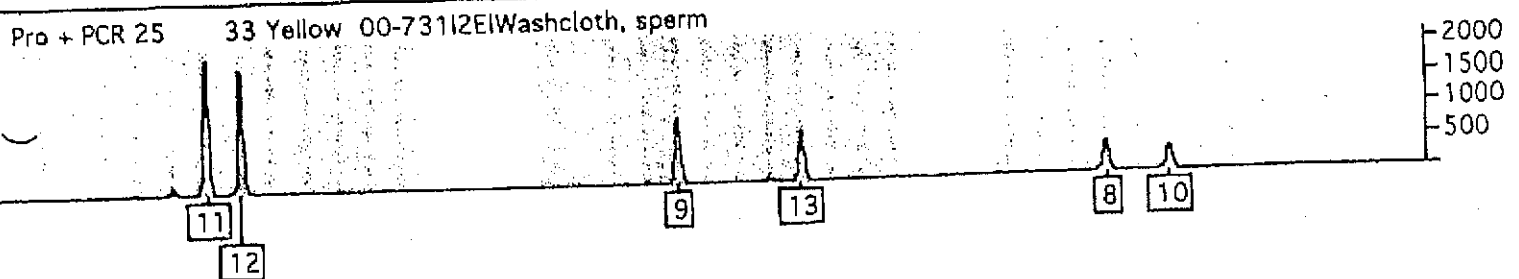
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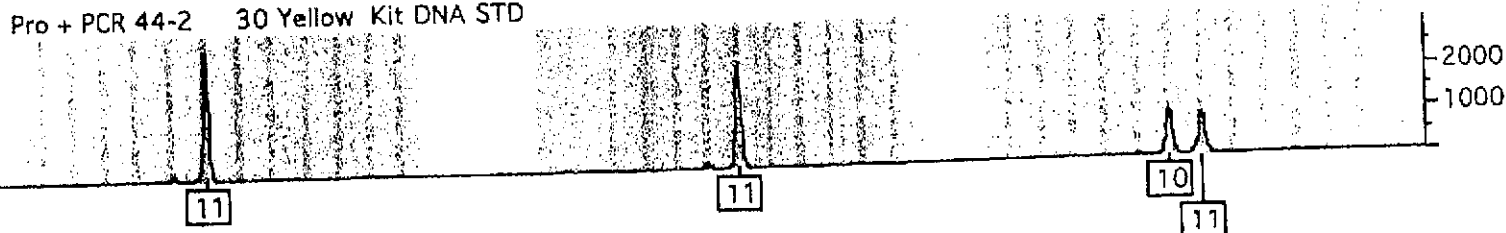
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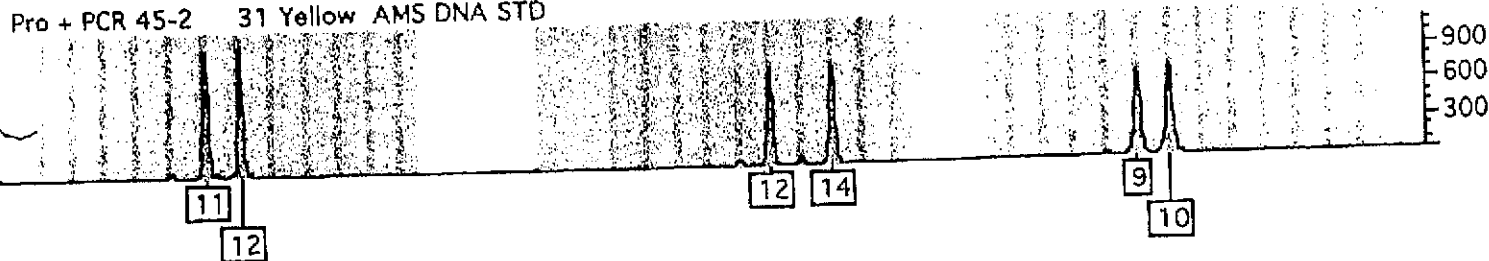
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Pro + PCR 44-2 30 Yellow Kit DNA STD



Pro + PCR 45-2 31 Yellow AMS DNA STD



Pro + PCR 46-2 58 Yellow PCR blank

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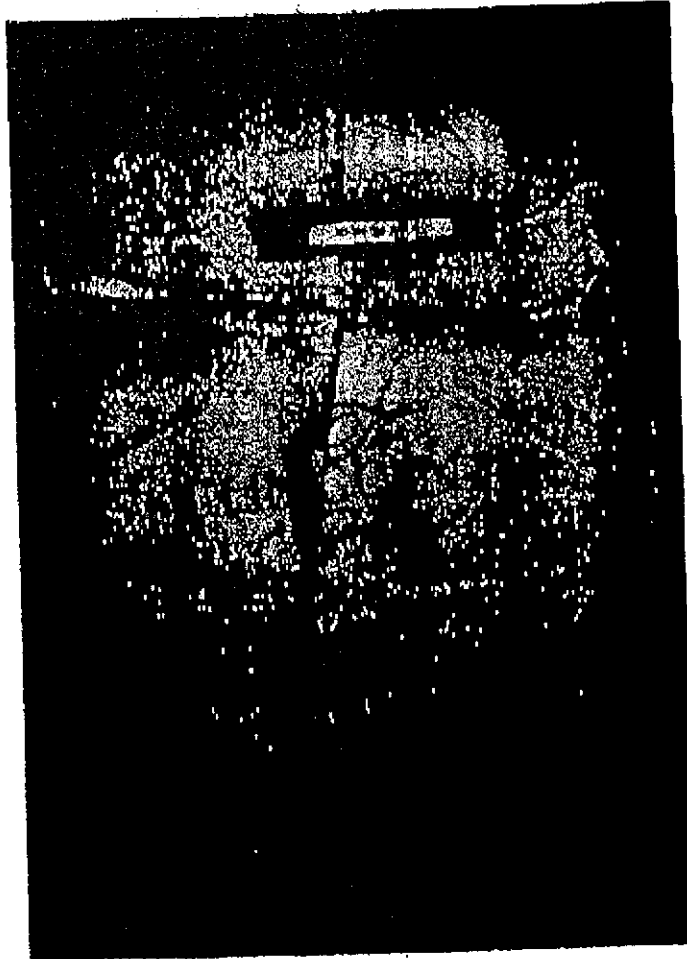


FIGURE 1
ITEM 2
WASHCLOTH FROM
JENNIFER TENNANT
PACKAGING